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ecology and environment, inc.
101 YESLER WAY, SEATTLE, WASHINGTON, 98104, TEL. 206/624-9537
International Specialists in the Environment

MEMORANDUM

DATE: January 28, 1988

TO: Priscilla Anderson, TATM, Toxicologist, E&E, Seattle

THRU: Michael G. Bray, TATM, Chemist, E&E, Seattle MB

FROM: David R. Byers, TATM, Chemist, E&E, Seattle DRB

SUBJ: **Inorganic Data Quality Assurance Review, Corigliano**

REF: TDD T10-8707-009
PAN TWA-0526-RFA

The quality assurance review of 64 soil samples collected from the Corigliano site, Spokane, Washington has been completed. Inorganic analyses were performed by Columbia Analytical Services, Inc., Longview, Washington.

Data Qualifications

I Sampling Holding Times

Sample	Date Sampled	Date Analyzed Metals	Mercury	Cyanide
T7070509-518	7-3-87	9-29-87	8-27-87	8-15-87
T7070521,522	7-29-87	9-18-87	8-28-87	9-16-87
T7080361-390	8-19-87	10-8-87	9-14-87	
T7070401,417	8-2-87	10-8-87	9-14-87	
T7070425-448	8-21-87	10-9-87	9-3-87	
T7070457-481	8-22-87	10-9-87	9-3-87	
T7080494,495	8-24-87	10-8-87	9-3-87	
T7080531-638	8-25-87	10-8-87	9-3-87	
T7080745,786	8-28-87	10-19-87	9-5-87	
T7080817	8-31-87	10-19-87	9-5-87	
T7080825-841	9-1-87	10-19-87	9-5-87	
T7080910,911	9-2-87	10-19-87	9-25-87	
T7080918-927	9-3-87	10-19-87	9-25-87	
T7080874	9-2-87	10-19-87	9-25-87	
T7080931	9-3-87	10-19-87	9-25-87	
T7090032,033	9-9-87	11-12-87	10-6-87	

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Sample	Date Sampled	Date Analyzed Metals	Mercury	Cyanide
T7090034,037	9-1-87	11-12-87	10-6-87	
T7090028-031	9-12-87	11-12-87	10-6-87	
T7090072	9-11-87	11-12-87	10-6-87	
T7090073	9-12-87	11-12-87	10-6-87	
T7080685	8-26-87	10-19-87	9-25-87	
T7080710-775	8-27-87	10-19-87	9-25-87	
T7080570-647	8-26-87	10-19-87	9-25-87	
T7070521,522	7-29-87	9-18-87	8-28-87	
T7070555-605	8-1-87	9-18-87	8-28-87	

Holding times for all cyanide analyses were exceeded. Holding times for mercury analysis were exceeded for samples T7070509-518 (55 days). For these samples, all positive results are flagged (J) and minimum detection limits are flagged (UJ) as estimates.

II Calibration

A. Initial Calibration and Calibration Verification

All initial calibration and calibration verification results were reviewed. ICP and AA calibrations were performed using a blank and at least three standards. All initial calibration and calibration verification results were within the accepted control limits of 80-120% for mercury and 90-110% for all other elements. Spot check recalculations were performed on raw data to verify results.

B. Continuing Calibration

Continuing calibration was performed on at least 10% of the samples using mid-range level independent standards, except for mercury, for which EPA control standards were used. All continuing calibration results were within the accepted control limits and reagent blank results were less than the contract required detection limits. Spot check recalculations were performed on raw data to verify results.

III Blanks

Method blanks were prepared at a minimum of 5% of the total number of samples analyzed. All method blank concentrations were less than the contract required detection limits.

IV Interference Check Sample Analysis

EPA interference check samples numbered 7, 17 and 19 were analyzed at the begining and end of each sample batch analyzed. The results were spot checked and verified to be within 20% of the mean value.

V Laboratory Control Sample Analysis

At least one laboratory control sample was analyzed for each batch of samples. The data was verified to be within 80-120% of the accepted value. No laboratory control sample data was available for cyanide analyses.

VI Duplicates

A. Laboratory Duplicates

Laboratory duplicate analyses were performed for each batch of samples. The recommended guideline for acceptance of laboratory duplicates of soil samples is ± 35 relative percent difference. Those samples that exceeded this guideline for any specific analyte are listed below.

Relative Percent Difference

Analyte	T7080-361,417	T7080-425,481	T7080-494,638	T7090-028,073
Ba	-	42	-	123
As	-	47	39	-
Cr	90	52	-	37
Cu	-	48	-	-
Pb	-	74	-	-
Hg	-	66	-	-
Zn	-	53	-	53

Although the calculated relative percent difference on some analytes exceeded the recommended guideline of 35%, no action is required.

B. Blind Duplicates

Blind duplicate samples were submitted for each batch of samples analyzed. The relative percent difference between the results are as follows. No action is required based upon blind duplicate results.

Relative Percent Difference

Analyte	T7070-517,518	T7080-389,390	T7080-457,458	T7080-494,495
Sb	-	40.9	10.9	-
As	36.1	5.8	15.1	12.0
Ba	17.4	33.3	13.3	31.6
Be	-	12.8	35.0	18.2
Cd	3.0	32.8	7.1	-
Cr	76.3	31.5	19.6	20.7
Cu	1.7	130.6	17.2	11.0
Pb	51.5	26.6	2.9	15.4
Hg	-	32.2	27.3	-
Ni	11.7	1.3	1.2	5.1
Se	-	-	-	-
Ag	-	-	-	-
Tl	-	-	-	-
Zn	21.6	34.9	17.5	0.4

Relative Percent Diference (cont.)

Analyte	T7080-531,532	T7080-586,587	T7080-910,911	T7090-030,031
Sb	9.5	20.2	-	47.9
As	34.4	64.3	43.5	0
Ba	78.3	29.4	3.9	7.3
Be	-	-	8.3	-
Cd	7.4	-	-	30.4
Cr	9.7	13.0	11.1	15.4
Cu	21.1	4.6	3.6	21.8
Pb	-	39.2	15.8	6.2
Hg	10.1	-	-	66.7
Ni	11.7	15.4	5.4	4.9
Se	-	-	-	-
Ag	-	-	-	-
Tl	-	-	-	-
Zn	9.9	6.7	7.6	6.5

VII Spikes

Spiked sample analysis for each analyte was performed for each batch of samples. All spike recoveries fell within the acceptable 75-125% recovery range with the exception of the following.

Sample Numbers	Analyte	Spike Recovery
T7070509-518	Chromium	71%
	Copper	70%
	Selenium	12%
T7080361-417	Antimony	17%
	Chromium	70%
	Thallium	66%
T7080425-481	Chromium	170%
	Nickel	153%
	Antimony	58%
T7080494, 495, 531,532,638	Antimony	23%
T7080570, 647,	Antimony	66%
685, 710, 758,	Arsenic	148%
775	Beryllium	129%
T7080745, 786,	Antimony	51%
817, 825, 827,	Selenium	43%
835, 841	Thallium	74%
T7080910-931	Antimony	51%
	Selenium	43%
	Thallium	74%
T7090028-31, 72, 73	Antimony	61%
T7090032-37	Antimony	60%
	Selenium	74%

If spike recoveries were >125% and the reported sample result was less than the contract required detection limits (CRDL), no action is required. If the reported sample result was greater than the CRDL, the result for that analyte was flagged (J) as an estimate.

If the spike recovery fell within 30-74% and a reportable quantity for that analyte was detected, the results for that analyte were flagged (J) as estimates. If no analyte was detected the results were flagged (UJ) as possibly having elevated detection limits.

If the spike recovery level was <30% and the reported quantity for that analyte was less than the CRDL, the result was flagged (R) as unusable. For these samples, the possibility of false negatives exists. If there was a reportable quantity detected the results were flagged (J) as estimates. These results could be biased significantly low and the reported concentration for that analyte is the minimum concentration at

VIII Overall Asessment of Data for Use

The overall usefulness of the data is based on the criteria outlined in "Laboratory Data Validation Functional Guidelines for Evaluating Inorganic Analyses" (5-582-5-5-01).

Based upon the information provided, the data is acceptable for use with the above stated data qualifications.